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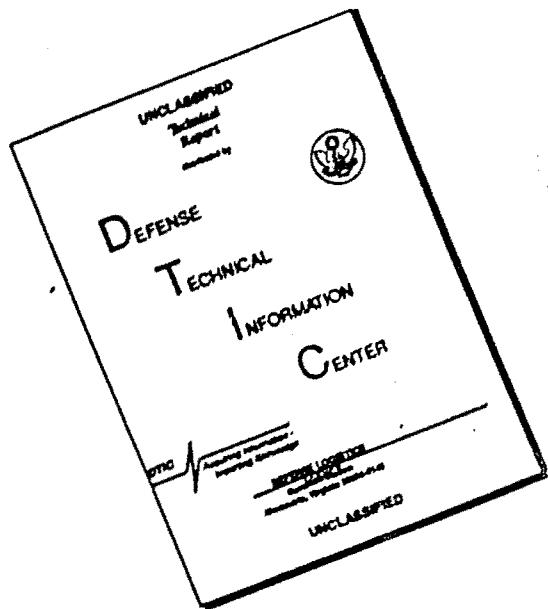
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13 May 1966

HEADQUARTERS
168TH ENGINEER COMBAT BATTALION
APO US Forces 96227

13 May 1966

SUBJECT: Operational Report of Lessons Learned for Period Beginning
1 January 1966, Report Control Symbol CSGPO-28 (RI)

TO: See Distribution

1. References:

- a. AR 525-24
- b. USARV Circular 870-1.
- c. 18th Engineer Brigade Regulation 870-1.

2. Report is transmitted herewith in compliance with above referenced
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FOR THE COMMANDER:

R. M. Snow
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OPERATIONAL REPORT ON LESSONS LEARNED
PERIOD BEGINNING 1 JANUARY 1966

BACKGROUND

The 168th Engineer Battalion (Combat) arrived in-country on 27 November 1965 and was assigned to the 159th Engineer Group (Const). Deployment of the battalion was as follows: On 1 January 1966, HQ & HQ Co and Co A were at Di An, 1st Infantry Division main base. Co B was at Lai Khe Plantation, 3rd Brigade, 1st Infantry Division base, and Co C at Long Binh at the 93rd Evacuation Hospital area.

SECTION I - Unit Activities from 1 January 1966 to 30 April 1966

Company A was assigned the mission of cantonment construction in Di An. Construction included tropical buildings, drainage, roads, hardstands, latrines and showers. 1st Engineer Battalion, 1st Infantry Division had construction material on hand and that material was drawn and construction started on a priority list established by 1st Infantry Division Support Command. First priority was for unit kitchens and dining halls, and a total of 16 kitchens and 32 dining halls were completed during this period.

Work proceeded to construction of administrative type buildings. A wood frame building with 3' high masonry walls was used for most buildings. 64 tropical buildings, 20' x 40', two 20' x 48' round wall quonsets and thirteen 20' x 50' shed type buildings were completed during the reporting period and 21 other buildings of various types are now under construction.

A carpenter shop was set up and began fabricating latrines. Latrines of various sizes with a total of 98 holes were completed and showers with a total of 80 shower heads were constructed. The carpenter shop also prefabricated roof trusses for tropical building construction. 832,040 Sq Ft of hardstands were also constructed and approximately 800 linear feet of culvert emplaced. The drainage system was improved by excavating 27,660 Cu Yd of pan cut ditches.

Approximately 220 indigenous personnel were hired daily and employed as masons, carpenters, and common laborers, thereby augmenting the available work force.

Company B started construction of a C-130 airfield facility at Lai Khe and has completed the 3300' runway and one 300' overrun. A maintenance hardstand and turn-around have been completed along with the construction of 25 heliicopter (UH-1) landing pads along an access road which eventually will be improved into a parallel taxiway. Due to the beginning of the rainy season, work continued at a slower pace on the second maintenance hardstand and aircraft turn-around. All areas were treated with asphalt for dust control prior to the placement and anchorage of M-8 landing mat for the final surfaces.

OPERATIONAL REPORT ON LESSONS LEARNED (Cont)

Company B also completed the construction of 38 buildings for administrative use, showers (36 heads), and latrines (222 holes). Work continues on the improvement of roads and drainage with 1,056 linear feet of two-way roads, 3,500 linear feet of large ditches, and 1,233 linear feet of culverts completed.

The company operated a laterite pit to supply surfacing materials for all hardstand areas and roads. During the period, 54,209 tons of laterite were excavated. One enlisted man was killed while probing for VC mines in the pit and an officer was wounded when a mine detonated beneath his vehicle in the same area. The company uses ambush patrols of one officer and 12 EM at night to guard the pit to preclude the further emplacement of mines by the VC. The pit is cleared each time any activity is heard in the area by the night ambush patrols.

The company operated the water point for the brigade and issued 2,046,419 gallons of potable water.

Since Lai Khe is 32 miles by road from Di An, supply convoys, with up to battalion size tactical units giving security, were used to transport construction materials on 7-11 February, 18-19 February, 1-2 March, 9-10 March, 18-19 March, and 17-18 April. During long periods when no convoys were scheduled and conducted, critical supplies and spare parts were lifted by use of CH-47 helicopters, and in the case of small shipments, UH-1 helicopters were used.

Regular staff visits to Company B continued and proved beneficial to the company, the supported brigade and to the battalion commander and staff for planning and control. These visits can be made by use of air transportation only.

Company C continued construction of facilities for the 93rd Evacuation Hospital and was given an additional construction mission of augmenting the 46th Engineer Battalion (Cons') in the construction of the headquarters complex of II Field Forces Vietnam. The 93rd Evacuation Hospital project was completed the last week of February and included 26 quonsets (20' x 48'), three 16 hole latrines, one 20' x 48' tropical building, and one shower containing eight heads. The headquarters complex project is continuing and to date, Company C has constructed 28 quonset type buildings (20' x 48') and two 20' x 50' shed type quonsets in this area. One platoon displaced to Cu Chi, 25th Infantry Division main base, on 23 February 1966 to assist the 65th Engineer Battalion in construction of roads and drainage ditches. During the period 23 February thru 30 April, this platoon, augmented by equipment from headquarters company and trucks from the 617th PBC, cleared six acres of jungle, excavated 6,220 cubic yards of fill, hauled 3,694 cubic yards of laterite, erected five quonset type (20' x 48'), and two shed type prefabricated buildings (20' x 50')

Company C employs approximately 140 indigenous personnel on various construction projects as masons, carpenters, and general laborers.

OPERATIONAL REPORT ON LESSONS LEARNED (Cont)

The 362d Engineer Company (Light Equipment) was reassigned from the 937th Engineer Group (Const) at Qui Nhon to the 159th Engineer Group (Const) and was placed under the operational control of this organization with duty station at Cu Chi. The unit's advance party arrived at Di An on 25 March and the remainder of the unit arrived in small increments and were transported directly to Cu Chi by convoy. The primary mission was construction and improvement of the road and drainage system. During the period 1 April thru 25 April the company moved 22,845 cubic yards of spoil while piling 21,120 linear feet of ditches. The unit hauled 60,241 cubic yards of laterite to various roads and hardstands. On 25 April, the unit was placed under the operational control of the 588th Engineer Battalion (Combat) when construction responsibility at Cu Chi was transferred to that unit.

Headquarters company continued support of letter companies in the various locations. The battalion supply section draws construction materials from two widely separated locations. The locations are at Long Binh, 15 miles to the east, and Saigon, 18 miles to the southwest. The amount of materials transported is limited by the availability of transportation, the off-loading capabilities, and the distance travelled.

Transportation within the battalion is limited and additional vehicles must be requested from 159th Engineer Group (Const) and 1st Infantry Division. Transportation received has been limited. This lack of transportation has caused a backlog of materials at the storage areas.

Once materials have been transported to the battalion, the off-loading capabilities are limited to one crane and one wrecker. When the equipment is required elsewhere, the off-loading must be accomplished by hand.

Two of the supported companies are located in areas that require unannounced combat convoys. During the interval between these convoys, material must be stockpiled. Normally the convoys are announced only one day in advance. This again presents the problem of acquiring sufficient transportation and loading capabilities. Transportation has been fairly accessible in the past, but it has been almost impossible to augmentate the loading capabilities.

The operations section continued the design of needed structures, organized and controlled supply convoys, and directed and controlled construction.

Headquarters company also employs approximately 200 indigenous personnel daily who are used as construction material handlers by S-4, mechanics helpers by battalion maintenance section, and general laborers who contribute to the construction of drainage structures as well as self help.

At Di An, 1st Infantry Division directs that combat patrols and night ambushes, requiring one or two officers and from 13 to 20 EM, be conducted on an average of twice monthly. In order to conduct these combat operations and to give Company A and Company C combat training, personnel are selected both from headquarters and one line company each time. As is expected, these operations detract somewhat from the construction mission.

SECTION II
LESSONS LEARNED

1. The following are lessons learned during the reporting period:

a. Concrete

(1) Item: Hot weather placing and curing.

(2) Discussion: The extreme hot climate in the RVN poses several problems in the placing and curing of concrete. The hot sun beating down on foundations, gravel and sand, dries these items to a point where the normal amount of water in a batch of concrete is insufficient to prevent rapid evaporation, causes rapid curing and cracking.

(3) Observation: To alleviate the problem, before placing the concrete, the foundation, gravel and sand are thoroughly saturated with water, thereby cutting the absorption rate. The amount of water in the mix is adjusted accordingly. Another method found feasible but not practical, is obtaining ice and cooling the water in the mix. Also, after the concrete has begun to set, earth dykes are placed around the edge and the pad flooded with water, thereby retarding the curing.

b. Ditches and Roads

(1) Item: Rainfall Runoff

(2) Discussion: The rainfall intensities in the RVN require that construction of roads and ditches be given added attention. Since a rainfall intensity of $2\frac{1}{2}$ inches per hour is used for design, the resulting ditches are wide and deep. Laterite is widely used on roads as a stabilizing material, but it becomes extremely slick when wet. Therefore, the resulting roadways, particularly single lane roads, with their high crowns and deep ditches, become hazardous when wet.

(3) Observation: Personnel should be cautioned on the hazardous nature of laterite roads when they are wet. Single lane roads should be built only when necessity demands it.

c. RVN Personnel

(1) Item: Utilization of RVN Personnel for Construction

(2) Discussion: RVN personnel are being utilized effectively in the construction of cantonment facilities. Skilled personnel, i.e., carpenters, masons, etc., adjust to US construction practices under supervision of US personnel. Unskilled personnel are being utilized as common laborers thereby releasing additional US personnel.

(3) Observation: Utilization of RVN personnel augments the available work force thereby adding additional construction force capability.

d. Security

(1) Item: Work Force Composition

COMMANDER'S RECOMMENDATIONS

If this combat battalion continues in the role of construction engineers, the following recommendations are made:

1. Convert combat battalions to TOE 5-35E. This provides needed equipment and personnel for the current construction mission. The utilities section of this TOE provides skills not available in the D-Series TOE, such as masons, carpenters, electricians, and plumbers.
2. Augmentation with an aviation section to allow the commander and staff to visit outlying companies for better command and control.
3. Augmentation of the battalion operations section with an engineering section, increased survey equipment and personnel and a soils section. These augmentations will allow the battalion to more fully carry out design, survey and testing for construction operations. This battalion has had to constitute an engineering and design section in order to fulfill construction and design responsibilities.
4. Augmentation of line companies and headquarters equipment platoon with water distributors and compaction equipment for horizontal construction. Augmentation of line companies with trailer mounted DeWalt Saw sets to enhance vertical construction capabilities.

Edwin F. Pełoski
EDWIN F. PEŁOSKI
Lt Col, CE
Commanding

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OPERATIONAL REPORT ON LESSONS LEARNED

(2) Discussion: The rapid build-up of base camps by engineer combat battalions poses a particular vehicular problem. The limited number of vehicles for hauling and unloading of construction materials creates a delay between the arrival of construction materials in country and their arrival at final destination.

(3) Observations: S-4 sections of combat battalions should be supplied with additional hauling and unloading equipment.

f. Communications

(1) Item: Communications Equipment

(2) Discussion: Construction operations often require that small work parties be dispatched to many locations, necessitating radio communications be used for contact with parent unit. The old family series AM radion are not dependable over even short distances. FM radios are therefore used, and an insufficient number of FM radios sometimes necessitates borrowing from companies within the battalion in order to carry out some missions.

(3) Observation: It is felt that receipt of the new series radios will solve this problem.

g. Maintenance

(1) Item: Lubrication of Vehicles and Engineer Equipment

(2) Discussion: It has been found that vehicles and heavy engineer equipment subjected to constant use require lubrication more frequently than specified on lubrication orders, due to alternately wet and dry conditions in the country.

(3) Observation: It has been found that lubricating at an interval of one-half that specified by lubrication orders keeps the equipment in operational condition longer and reduces the deadline rate.

h. Haul Capability

(1) Item: Flat Tires on 5 Ton Dump Trucks

(2) Discussion: It was found that an excessive amount of down time was encountered when insufficient spare tires were available to replace flats.

(3) Observation: Steps were taken to procure additional rims from a cannibalization point. With these rims, a sufficient number of repaired spare tires can be kept on hand thereby reducing down time. Indigenous labor is utilized to repair flat tires, thereby relieving US personnel for more complex tasks.